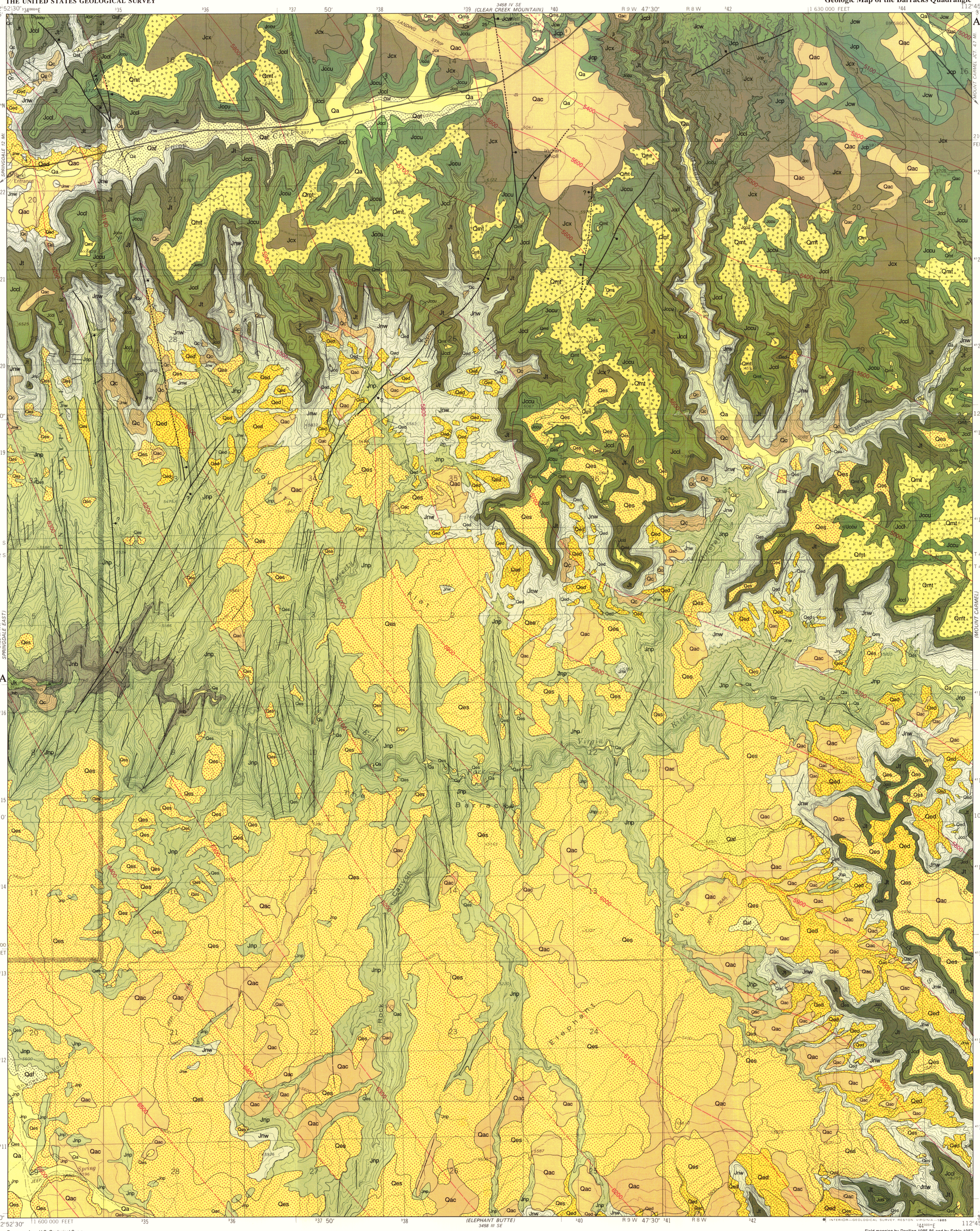
UTAH GEOLOGICAL SURVEY
UTAH DEPARTMENT OF NATURAL RESOURCES
in cooperation with
THE UNITED STATES GEOLOGICAL SURVEY

Plate 1
Utah Geological Survey Map 147
Geologic Map of the Barracks Quadrangle



Base map from U.S. Geological Survey, Barracks 7.5′ quadrangle, 1980.

Field mapping by Doelling 1985-86 and by Sable 1987.
Cartography by Patricia H Speranza.

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

1993 DECLINATION AT CENTER OF MAP

QUADRANGLE LOCATION

GEOLOGIC MAP OF THE BARRACKS QUADRANGLE, KANE COUNTY, UTAH

by
Edward G. Sable, U.S. Geological Survey, Denver
and Hellmut H. Doelling, Utah Geological Survey

1993

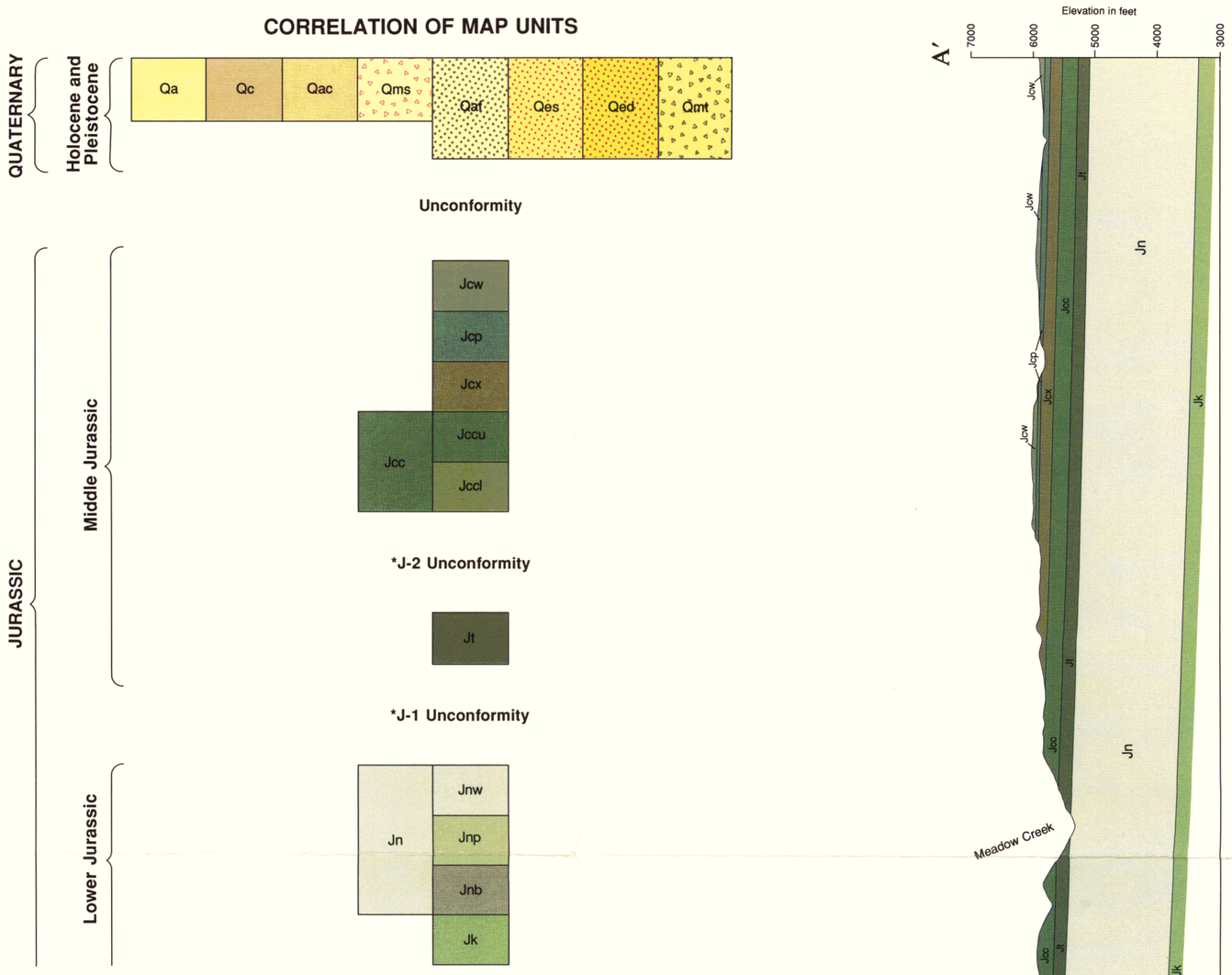
UTAH GEOLOGICAL SURVEY
UTAH DEPARTMENT OF NATURAL RESOURCES
in cooperation with
THE UNITED STATES GEOLOGICAL SURVEY

Plate 2
Utah Geological Survey Map 147
Geologic Map of the Barracks Quadrangle

MAP SYMBOLS

- Depositional contact--Includes precisely located, approximate, and inferred contacts.
- Contact of informal units in Navajo Sandstone.
- Fault--Dotted where concealed; queried where sense of movement is uncertain; bar and ball on downthrown block.
- Joint or fault trace (with minimal or unknown offset) in bedrock, mostly plotted from aerial photographs.
- Lineament in surficial deposits, observed on aerial photographs. Possibly caused by fault or joint trace in underlying bedrock.
- 8 Strike and dip of beds.
- Structure contour--Datum, top of Navajo Sandstone; dashed where land surface is below datum; contour interval 100 feet (30 m).

CORRELATION OF MAP UNITS



*Unconformity of Pipiringos and O'Sullivan (1978)

PERIOD	EPOCH	FORMATION	SYMBOL	THICKNESS feet (meters)	LITHOLOGY
QUATERNARY	Holocene and Pleistocene	Quaternary	Q	0-50 ? (0-15)	
JURASSIC	Middle Jurassic	Carmel Formation: Winsor Member	Jcw	190-210 (58-64)	
		Carmel Formation: Paria River Member	Jcp	60-80 (18-24)	
		Carmel Formation: Crystal Creek Member	Jcx	150-180 (46-55)	
		Carmel Formation: Co-op Creek Limestone Member	Jcc	250 (76)	
		Temple Cap Sandstone	Jt	160-200 (49-60)	J-2 / J-1
	Lower Jurassic	Navajo Sandstone: White unit	Jnw	400-600± (122-183±)	
		Navajo Sandstone: Pink unit	Jnp	900± (274±)	
		Navajo Sandstone: Brown unit	Jnb	350 (107)	
		Kayenta Formation (part)	Jk	150+ (46+)	

DESCRIPTION OF MAP UNITS

Qa — Alluvium (Quaternary) -- *Dominantly fine- to medium-grained sand, mostly pale orange to yellowish brown, locally contains beds of poorly sorted, interstratified, pebble- to cobble-size gravel composed of locally derived limestone and sandstone. Includes modern stream deposits and older floodplain deposits adjacent to modern streams. In part includes poorly defined alluvial fans and aprons, and colluvium along valley walls.*

Qac — Mixed alluvium and colluvium (Quaternary) -- *Sand, silt, and clay on smooth, gentle, in part pediment-like surfaces, deposited mostly as sheetwash derived from reworking of eolian sand and colluvium. Unit probably less than 10 feet (3 m) thick.*

Qaf — Mixed stream alluvium and fan deposits (Quaternary) -- *Sand, silt, and poorly sorted, subangular to angular sandstone and limestone pebble and cobble gravel. Occurs in fan and fan-apron deposits mostly along stream valleys.*

Qmt — Talus (Quaternary) -- *Sand and sandstone talus blocks along base and sides of mesas and buttes. Thickness variable; probably less than 50 feet (15 m) thick.*

Qms — Landslide deposits (Quaternary) -- *Angular sandstone blocks of Cretaceous age in sand- to clay-sized matrix.*

Qes — Eolian sheet sand (Quaternary) -- *Sand, reddish orange, pale orange, and yellowish gray, fine to medium grained, derived mainly from Navajo Sandstone; widespread as sheets and as fillings in topographically low areas. Locally includes small bedrock outcrops. Estimated to be less than 10 feet (3 m), but locally as much as 30 feet (9 m) thick.*

Qed — Eolian sand in dunes and ramps (Quaternary) -- *Sand as above, mostly reddish orange, in mostly vegetation-stabilized sand ramps (climbing and falling dunes) flanking buttes and mesas and as small dune fields. May be as much as 50 feet (15 m) thick.*

Qc — Colluvium (Quaternary) -- *Homogeneous red and orange clay and silt matrix containing limestone platelets; on buttes and mesas where underlain by Co-op Creek Limestone Member of Carmel Formation, and silty to sandy material on other units of the Carmel Formation. Estimated to be less than 5 feet (1.5 m) thick.*

Carmel Formation (Middle Jurassic) -- *about 700 feet (213 m) thick; uppermost beds eroded.*

Jcw — Winsor Member -- *Upper 165 feet (50 m) is sandstone, yellowish gray, light gray and pale orange, medium grained, and cross-bedded. Lower 45 feet (14 m) is sandstone and mudstone, reddish brown to light brown, fine grained; unit thickness is 210 feet (64 m).*

Jcp — Paria River Member -- *Interbedded reddish-brown and gray siltstone, mudstone, gypsum, and minor fossiliferous limestone; basal unit is gypsum, white, gray, and moderate pink, massive, cliff forming, with minor shale, about 15 to 45 feet (6-14 m) thick; unit thickness is 60 to 80 feet (18-24 m).*

Jcx — Crystal Creek Member -- *Gypsiferous sandstone, siltstone, and mudstone, reddish brown, light brown, and light gray, interbedded with minor clay-ball conglomerate and gypsum, 150 to 180 feet (46-55 m) thick.*

Jcc / Jccu / Jccl — Co-op Creek Limestone Member -- *Mostly limestone and calcareous shale. Limestone, very pale orange to gray, mostly micritic but also oolitic, sandy, and coquinoid; minor dolomite and sandstone. Fossils include pelecypods, gastropods, and crinoid columnals. Upper unit of ledge-forming limestone and dolomite (Jccu), about 100 feet (30 m) thick, weathers to very pale shades of gray; lower unit (Jccl) is slope-forming, platy limestone and shale overlying ledge-forming limestone containing thin beds of reddish-orange and gray siltstone, sandstone, mudstone, and local conglomerate at base, about 150 feet (46 m) thick. Basal contact is sharp and planar. Member thickness is about 250 feet (76 m).*

Jt — Temple Cap Sandstone (Middle Jurassic) -- *White Throne Member is gray to pink sandstone, with high-angle, thick crossbedding sets; massive and cliff-forming, 100 to 140 feet (30-43 m) thick. Underlying Sinawava Member is slope-forming, reddish-orange to reddish-brown sandstone, siltstone, and mudstone, 40 to 60 feet (12-18 m) thick. Two named members are visible in outcrops, but not mapped separately due to scale. Basal sandstone bed tabular and locally conglomeratic, 2 to 4 feet (1 m) thick, basal contact is abrupt and planar. Total formation thickness is 160 to 200 feet (49-60 m).*

Navajo Sandstone (Lower Jurassic) -- *divided into three informal units, shown undivided only on cross section, 1,650 to 1,850 feet (503-564 m) thick.*

Jnw — White unit -- *Sandstone, pale orange to gray, quartzose, fine to medium grained, well sorted; large-scale tabular- and wedge-planar cross-beds and thick cross-bed sets; weathers to light-gray hues; moderately well indurated, in part with calcareous cement; forms steep-sided hillsides and cliffs. Unit is 400 to 600 feet (122-183 m) thick.*

Jn / Jnp — Pink unit -- *Sandstone similar to white unit, but weathers reddish orange, reddish brown, and pale to moderate red; is weakly to moderately cemented with iron oxides; forms rolling topography of low to moderate relief. About 900 feet (274 m) thick.*

Jnb — Brown unit -- *Sandstone and minor siltstone and mudstone; reddish brown to gray, contains large-scale tabular- and wedge-planar cross-beds to small-scale trough crossbeds; iron oxide and siliceous cement; resistant and cliff to ledge forming, lower beds appear to intertongue with the underlying Kayenta Formation. About 350 feet (107 m) thick.*

Jk — Kayenta Formation (Lower Jurassic) -- *Siltstone, mudstone, and sandstone, reddish orange to reddish brown, mostly medium-planar bedded, in part with small- to moderate-scale trough cross-beds. Only upper 150 feet (46 m) exposed.*